

*a 4
(concluded)*
substantially following the rippled contour of the onplant bone-facing surface 603), the implant 610 may be removed, and an orthodontic appliance, for example a bracket 634, may be attached directly to the onplant 601.

In the Claims

Cancel claims 1-37.

Add the following new claims:

Sub B1
38. (New) An implant for use as an anchor in the mouth in creating a stabilizing or moving force, comprising:

an elongated body having an in-bone portion connected to an above-bone portion, said in-bone portion and said above-bone portion each having an inner end and an outer end, the cross-sectional area of said above-bone portion inner end being greater than the cross-sectional area of said in-bone portion outer end, thereby forming a shoulder having a bone-contacting surface on said above-bone portion inner end capable of resting on a part of the bone surface adjacent to an opening in the bone when said implant is positioned in the mouth;

said elongated body further including a securing section for attaching an orthodontic appliance to said elongated body.

2 39. (New) The implant of claim *38* wherein said securing section includes a threaded cylindrical bore extending from said above-bone portion outer end into said elongated body.

3 40. (New) The implant of claim *39* wherein said in-bone portion includes an outer circumferential surface having screw threads.

12
4 *41.* (New) ³ The implant of claim *40* in combination with an orthodontic appliance having a fastening section, said fastening section including a threaded cylindrical post for engaging said threaded cylindrical bore.

5 *42.* (New) ¹ The implant of claim *38* wherein said above-bone portion has a cross-sectional shape along at least a part of its length which is non-circular.

6 *43.* (New) ⁵ The implant of claim *42* wherein said non-circular shape includes at least one flat.

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7 *44.* (New) ¹ The implant of claim *38* wherein said securing section includes a threaded cylindrical post extending outward from said above-bone portion outer end.

8 *45.* (New) ⁷ *Exhibit C* The implant of claim *44* in combination with an orthodontic appliance having a fastening section, said fastening section including a threaded cylindrical bore for engaging said threaded cylindrical post.

9 *46.* (New) ¹ The implant of claim *38* wherein said elongated body includes a bioresorbable material.

10 *47.* (New) ¹ The implant of claim *38* wherein said elongated body includes an osteoinductive factor.

11 *48.* (New) ¹ The implant of claim *38* wherein said elongated body includes an infection-inhibiting coating.

Sub B2
49. (New) An implant for use as an anchor in the mouth in creating a stabilizing or moving force, comprising:
an elongated body having an in-bone portion connected to an above-bone portion, said in-bone portion and said above-bone portion each having an inner end and an

outer end, the cross-sectional area of said above-bone portion inner end being greater than the cross-sectional area of said in-bone portion outer end, thereby forming a shoulder having a bone-contacting surface on said above-bone portion inner end capable of resting on a part of the bone surface adjacent to an opening in the bone when said implant is positioned in the mouth;

said implant further including an integrally formed orthodontic
appliance extending from said above-bone portion of said elongated body.

50. (New) An implant for use as an anchor in the mouth in creating a stabilizing or moving force, comprising:

an elongated body having an inner end, an outer end, a securing section for attaching an orthodontic appliance to said implant, and a retention portion for assisting in securing said implant within an opening in a bone surface in the mouth;

said retention portion including a section of the elongated body extending from one of said inner end and said outer end at least part-way toward the other of said inner end and said outer end, said retention portion further including a tapered bore and at least one longitudinal cut, said tapered bore and said longitudinal cut extending from said one of said inner and outer ends with said tapered bore having a cross-sectional area which gets smaller in the direction of said inner end, whereby when said implant is positioned in an opening in a bone surface of the mouth, and an orthodontic appliance having a corresponding fastening section is attached to said elongated body, a portion of the fastening section biases against a portion of the sidewall of said tapered bore and moves said retention portion radially outward thereby securing said implant in the opening in the bone surface.

14

51 (New)

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The implant of claim 50 in combination with an orthodontic appliance, having a fastening section, said fastening section including a stem sized so as to bias against a portion of the sidewall of said tapered bore and move said retention portion radially outward, thereby assisting in securing said implant in an opening in a bone surface.

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52 (New)

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The implant of claim 50 wherein said securing section includes a threaded cylindrical bore.

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53 (New)

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The implant of claim 52 in combination with an orthodontic appliance having a fastening section, said fastening section including a threaded cylindrical post corresponding with said threaded cylindrical bore, said fastening section further including a stem sized so as to bias against a portion of the sidewall of said tapered bore and move said retention portion radially outward, thereby assisting in securing said implant in an opening in a bone surface.

Sub B3 54. (New) An implant for use as an anchor in the mouth in creating a stabilizing or moving force, comprising:

an elongated body having an inner end, an outer end, a securing section for attaching an orthodontic appliance to said implant, and a retention portion for assisting in securing said implant within an opening in a bone surface in the mouth;

said retention portion including a section of the elongated body extending from one of said inner end and said outer end at least part-way toward the other of said inner end and said outer end, said retention portion being formed of a shape-memory alloy and including a bore and at least two longitudinal cuts, said bore and said longitudinal cuts extending from said one of said inner end and said outer end at least part-way toward said other of said inner end and said outer end, said longitudinal cuts forming at least two leg portions, said retention portion

capable of assuming a predetermined shape in which said leg portions angle slightly radially outward when said retention portion reaches an ambient mouth temperature, thereby securing said implant in an opening in a bone surface in the mouth.

¹⁷
18 ~~55~~ (New) The implant of claim ~~54~~ wherein said securing section includes a threaded cylindrical bore extending from said outer end into said elongated body.

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19 ~~56~~ (New) The implant of claim ~~55~~ in combination with ~~an~~ orthodontic appliance having a fastening section, said fastening section including a threaded cylindrical post for engaging said threaded cylindrical bore.

^{19 B4}
20 ~~57~~ (New) An anchorage system for use in creating a stabilizing or moving force in the mouth, comprising:

an onplant having a bone-facing surface, an opposite face, and a hole extending through said onplant at an angle substantially perpendicular to said bone-facing surface; and

an implant for use in affixing said onplant to a bone surface in the mouth, said implant having an elongated body including an inner end and an outer end, a portion of said elongated body including said inner end capable of being positioned through said hole and in an opening in a bone surface in the mouth.

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21 ~~58~~ (New) The anchorage system of claim ~~57~~ wherein said elongated body includes a shoulder, said shoulder capable of biasing against said opposite face of said onplant.

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22 ~~59~~ (New) The anchorage system of claim ~~57~~ wherein said elongated body includes a securing section for attaching an orthodontic appliance to said implant.

23 *60.* (New) The anchorage system of claim *59* wherein said securing section of
said implant includes a threaded cylindrical bore.

24 (New) The anchorage system of claim 60 in combination with an orthodontic appliance having a fastening section, said fastening section including a threaded cylindrical post for engaging said threaded cylindrical bore.

25 *62.* (New) *20* The anchorage system of claim *51* wherein said implant is made of a
bioresorbable material.

Sub B5 63. (New) A method of forming an anchor in a non-occlusal surface of the mouth for use in creating a stabilizing or moving force, comprising the steps of:

providing an implant having an elongated body which includes an inner end, an outer end, an outer circumferential surface between said inner and outer ends, and a securing section for attaching an orthodontic appliance to said elongated body; and

positioning at least a part of said elongated body, including said inner end, in an opening in a bone surface selected from the group consisting of the buccal, labial, lingual and palatal surfaces of the maxillary jawbone and the buccal, labial and lingual surfaces of the mandibular jawbone, thereby forming an anchor in a non-occlusal surface of the mouth for use in creating a stabilizing or moving force.

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27-64. (New) The method of claim 63 further including the step of attaching [an] orthodontic appliance to said implant.

2855. (New) The method of claim 64 wherein said securing section includes a threaded cylindrical bore and said orthodontic appliance includes a fastening section having a

corresponding threaded cylindrical post, said attaching step including threading said post into said bore.

²⁹₆₆. (New) ²⁶ The method of claim ~~63~~ wherein said securing section is accessible at said outer end of said elongated body.

³⁰₆₇. (New) ²⁹ The method of claim ~~66~~ wherein said securing section includes a feature selected from the group consisting of a threaded cylindrical bore and a threaded cylindrical post.

³¹₆₈. (New) ²⁶ The method of claim ~~63~~ further including the step of forming an opening in a bone surface selected from the group consisting of the buccal, labial, lingual and palatal surfaces of the maxillary jawbone and the buccal, labial and lingual surfaces of the mandibular jawbone prior to said positioning step.

³²₆₉. (New) ²⁶ The method of claim ~~63~~ wherein said elongated body includes an in-bone portion connected to an above-bone portion, said in-bone portion and said above-bone portion each having an inner end and an outer end, the cross-sectional area of said above-bone portion inner end being greater than the cross-sectional area of said in-bone portion outer end, thereby forming a shoulder having a bone-contacting surface on said above-bone portion inner end capable of resting on a part of the bone surface adjacent to an opening in the bone when said implant is positioned in the mouth;

 said positioning step including inserting said in-bone portion into said opening in said bone surface, whereby said shoulder contacts the bone surface adjacent the mouth of said opening, said shoulder capable of distributing at least some force from ^{and} ~~an~~ orthodontic appliance

to the bone surface adjacent the mouth of said opening when an orthodontic appliance is attached to said implant.

33₇₀ (New) The method of claim ²⁶~~63~~ wherein said elongated body includes a retention portion for assisting in securing said implant within the opening in the bone surface in the mouth.

34₇₁ (New) The method of claim ³³~~70~~ wherein said retention portion includes a plurality of annular ridges positioned along said outer circumferential surface of said elongated body.

35₇₂ (New) The method of claim ³³~~70~~ wherein said retention portion includes a section of the elongated body extending from one of said inner end and said outer end at least part-way toward the other of said inner end and said outer end, said retention portion further including a tapered bore and at least one longitudinal cut, said tapered bore and said longitudinal cut extending from said one of said inner and outer ends with said tapered bore having a cross-sectional area which gets smaller in the direction of said inner end, whereby when said implant is positioned in the opening in the bone surface of the mouth, and ³⁴₇₁ an orthodontic appliance having a corresponding fastening section is attached to said elongated body, a portion of the fastening section biases against a portion of the sidewall of said tapered bore and moves said retention portion radially outward thereby securing said implant in the opening in the bone surface.

36₇₃ (New) The method of claim ³³~~70~~ wherein said retention portion includes a section of the elongated body extending from one of said inner end and said outer end at least part-way toward the other of said inner end and said outer end, said retention portion being formed of a shape-memory alloy and including a bore and at least two longitudinal cuts, said bore and said longitudinal cuts extending from said one of said inner end and said outer end at least part-way

toward said other of said inner end and said outer end, said longitudinal cuts forming at least two leg portions, said retention portion assuming a predetermined shape in which said leg portions angle slightly radially outward when said retention portion reaches an ambient mouth temperature, thereby securing said implant in the opening in the bone surface in the mouth.

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37 24. (New) The method of claim 63 wherein said elongated body includes a bioresorbable material.

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38 25. (New) The method of claim 63 wherein said elongated body includes an osteoinductive factor.

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39 26. (New) The method of claim 63 wherein said elongated body includes an infection-inhibiting coating.

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Sub B6 77. (New) A method of forming an anchor in a non-occlusal surface of the mouth for use in creating a stabilizing or moving force, comprising the steps of:
providing an implant having an elongated body and an integrally formed orthodontic appliance, said elongated body including an inner end and an outer end; and
positioning at least a part of said elongated body, including said inner end, in an opening in a bone surface selected from the group consisting of the buccal, labial, lingual and palatal surfaces of the maxillary jawbone and the buccal, labial and lingual surfaces of the mandibular jawbone, thereby forming an anchor in a non-occlusal surface of the mouth for use in creating a stabilizing or moving force.

78. (New) A method of forming an anchorage system in the mouth for use in creating a stabilizing or moving force, comprising the steps of:

placing an onplant on a bone surface in the mouth selected from the group consisting of the buccal, labial, lingual and palatal surfaces of the maxillary jawbone and the buccal, labial and lingual surfaces of the mandibular jawbone, said onplant having a bone-facing surface, an opposite face, and a hole extending through said onplant at an angle substantially perpendicular to said bone-facing surface; and

positioning a portion of an implant through said hole in said onplant and in an opening in said bone surface thereby affixing said onplant to said bone surface, said implant having an elongated body including an inner end and an outer end.

4279 (New) ⁴¹ The method of claim 78 wherein said elongated body includes a shoulder, said shoulder biasing against said opposite face of said onplant.

43 80. (New) The method of claim 28 wherein said elongated body includes a
securing section for attaching an orthodontic appliance.

44,81. (New) The method of claim 80 further including the step of attaching [an] orthodontic appliance. 43

45 82. (New) The method of claim 78 wherein said implant includes an integrally formed orthodontic appliance.

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46 83. (New) The method of claim 78 wherein said hole includes a threaded cylindrical bore and said elongated body includes a threaded cylindrical post, said positioning step including threading said threaded cylindrical post into said threaded cylindrical bore.

Remarks

This Reply is in response to the Office Action dated August 28, 1996. As noted above, Applicants have cancelled claims 1-37 and have submitted new claims 38-83. In addition,